

THE POLAR TIMES



Photograph from ANTARCTICA showing Dancing Adélie Penguins at McMurdo Sound
Credit: Eliot Porter E.P. Dutton

U.S. Antarctic Research Program 1978-1979

The 1978-1979 U.S. Antarctic Research Program began its most ambitious season yet with the completion of this year's WINFLY ("winter fly-in") flights to McMurdo Station early in September. More than 320 U.S. investigators will pursue almost 100 science projects this season, most of them in West Antarctica. Highlights will include the first intensive examination of the Byrd and Darwin Glaciers, the final season of the Ross Ice Shelf Project, and expanded investigations of krill and the biomass of the southern oceans.

Darwin Glacier Camp, to be located about 240 kilometers south of McMurdo Station, will be home base for U.S. scientists from seven institutions, as well as for scientists from New Zealand, West Germany, and Japan. Three U.S. Navy helicopters assigned to the Darwin Glacier Camp will move scientists to remote sites in the area and allow them to live in tent camps up to 185 kilometers from the home base. Most of the investigators will look at the geologic and glaciological features of the area to determine the history of the two glaciers and of the Ross Ice Shelf.

Byrd and Darwin Glaciers flow into the Ross Ice Shelf about 250 kilometers south of McMurdo Station. The Ross Ice Shelf, unlike the land-based ice sheet in East Antarctica, is a marine ice shelf which floats upon sea water and is grounded on the sea bottom as much as 2500 meters below sea level. It is possible that a gradual warming of the earth's climate, like the one that occurred during the last interglacial period about 18,000 years ago, might make the Ross Ice Shelf (and the Ronne-Filchner Ice Shelf as well) unstable and lead to the deglaciation of West Antarctica. Scientists working on the Byrd and Darwin Glaciers will try to discover exactly what happened during that last interglacial.

Other scientists working out of the Darwin Glacier Camp will look for meteorites where the glaciers flow into mountains which block their paths. Ice is ablated at these obstructions, forcing buried meteorites to the surface from deep inside the moving glacier. These meteorites, important specimens in themselves, also will help researchers determine how old the glaciers were when the meteorites fell.

Activities at the Ross Ice Shelf drill site, about 685 kilometers southeast of McMurdo Station, will be almost as numerous as those on the Byrd and Darwin Glaciers. The team at the drill site

("J-9") will try to improve on their success last year by drilling several more holes completely through the ice shelf, almost 420 meters thick at the site. Researchers again will examine bottom sediments left undisturbed since the shelf formed; they will sample life forms that exist even in the mud on the sea bottom beneath the shelf and in the water between the shelf and the sea floor; they will study the freezing and melting processes at the bottom of the shelf; and they will study the structure of the shelf and its movements.

At Palmer Station investigators will intensify their probes into the life cycle and population structure of antarctic krill and examine the ways other marine species interact with krill in the antarctic marine ecosystem. Krill, according to some researchers, might be the world's most underexploited marine food resource. The investigations conducted at Palmer Station may eventually help nations harvest this resource with wisdom and foresight and, at the same time, protect the antarctic ecosystem from harm.

Other research projects in biology, biomedicine, earth science, glaciology, meteorology, oceanography, and upper-atmosphere physics are scheduled throughout the season. The instruments and facilities at Amundson-Scott South Pole, Byrd, McMurdo, Palmer, and Siple Stations will serve investigators all year. Field camps will enable scientists to investigate the Dufek intrusion, Scott Glacier, Dome C, and the dry valleys of southern Victoria Land. U.S. Coast Guard icebreakers will help oceanographers work in the Ross and Weddell Seas. R/V *Hero* will support a full schedule of investigations in the Antarctic Peninsula area. The Antarctic Program research airplane has a taxing schedule of meteorological and geophysical measurements.

Scientists who will spend the coming winter at Siple Station will not have to live in the existing suite of buildings, now buried under tons of crushing snow. The Siple replacement facility is scheduled for completion early in 1979. This season the replacement building will give scientists access to a new VLF transmitter for investigations into the magnetosphere.

Temperature regime of the South Pole: results of 20 years' observations at Amundsen-Scott Station

W. SCHWERTDFFER

Department of Meteorology
University of Wisconsin
Madison, Wisconsin 53706

When Amundsen in Norway and Scott in England planned their expeditions to the South Pole about 67 years ago, some information regarding the conditions to be expected on the antarctic plateau was already available. In one of the greatest pioneering journeys of all time, Shackleton and his companions had discovered and mastered the Beardmore Glacier in December 1908 and had progressed south to latitude 88°23'S., only 180 kilometers from the Pole. They had to turn back that close to their goal since their supplies, food and fuel were insufficient, and made it to their base on Ross Island only because of the stamina of their leader. For 15 days, 1-15 January, they had stayed south of 87°S. at an elevation of approximately 3,000 meters above sea level. Shackleton gave a clear description of the antarctic plateau, including the daily temperatures which fluctuated between -23° and -40°, and averaged -29°C. He could not get, of course, any notion of the duration of the south polar summer. (Amundsen, 1912; Barrie, 1913; Shackleton, 1911).

When Paul Siple came to the South Pole on 30 November 1956, the first scientist to stay for a full year at this far-out place, he did not hesitate to dig, in 4 days of hard work, a 5.5 meter-deep pit. The purpose was to measure the temperature, which, at that depth, comes close to the mean annual value. Knowing about the summer temperatures from Amundsen's and Scott's reports, and assuming the temperatures of the coldest month should be as much below the annual mean as the summer temperatures are above it ("like it is in most other places"), he concluded that the winter temperatures might drop below -84°C (-120°F), a possibility he considered "half in apprehension and half in excitement." Nine months later, he was surprised as well as relieved to find that the winter of the antarctic plateau is different. In 1957, the lowest minimum was -74°C (-101°F), recorded in September, which was also the coldest month of the entire winter (Siple, 1959).

Since 11 January 1957, regular meteorological observations have been carried out at Amundsen-Scott South Pole Station (2,800 meters above sea level) without interruption. This impressive record reveals two remarkable features of the temperature regime. First, the south polar "summer" is very short; not more than about 30 days between mid-December and mid-January deserve that name. Two weeks later, the average temperature already lies about 8°C below that of the warmest days. This early and fast cooling on the continent's high plateau was one of the adversities contributing to the tragic end of Scott's journey. Second, the south polar winter is, as climatologists say, "coreless." Already in the last days of March it is nearly as cold as in the six following months. In the 20-year average, July is the coldest month, as Paul Siple expected, but only by a few tenths of a degree; in the last two decades April was twice and September four times the coldest month of the year (U.S. Weather Bureau, 1962-75).

The Polar Times

Copyright 1978 by the American Polar Society

No. 87

DECEMBER 1978

The World's Coldest Zoo

By Robert Locke

Associated Press

SAN DIEGO—The building seems to be filled with little people all dressed up in black tuxedos and waddling about like they were at a formal cocktail party.

But the party's held on four tons of crushed ice and some of the guests keep diving—tuxedo and all—into the icy swimming pool. The hors d'oeuvres are raw fish, swallowed whole.

The temperature is below freezing, which is just about right if you're trying to convince some 250 penguins that they're still near the South Pole.

The deception seems to work. Scott Drieschman, assistant curator at the Sea World aquarium here, said the penguins living in the 38-by-52-foot refrigerated room are breeding successfully and seem quite happy after as long as two years in their new home.

Part of the trick, Drieschman said, is to manipulate the room's electric lights to simulate the long darkness of the Antarctic winter and the sunshine of summer.

He said some biologists had worried the birds might become neurotic with nothing to do all day but play and sleep on the artificial ice, swim in the two artificial ponds and stand around on stubby legs.

But Drieschman said two collecting trips to the Antarctic convinced him that "all they do down there is eat, play around, sit around and sleep. There's not really a whole lot to do in Antarctica."

Penguins have been grounded for millions of years, ever since the wings of their ancestors evolved into short, powerful flippers used mostly for swimming in a kind of modified beast stroke. Their outer feathers fold into a hard, watertight shell that protects a layer of soft down.

Thoroughly adapted to life in one of the world's harshest environments—Antarctica—penguins "must have very specific requirements met just to keep them alive," Drieschman said.

He's trying, with his miniature Antarctica, to build the country's first self-sustaining colony of penguins—"sort of like a penguin bank where researchers can come and study the birds."

The colony also is planned as a commercial attraction at Sea World, a popular aquatic zoo.

Drieschman likes to haul out architects' plans for a \$2 million facility, complete with artificial snowstorms, that should allow penguins, scientists and tourists to co-exist.

He said construction may begin late next year and "there would be nothing like it anywhere in the world."

The penguin colony, which is not open to the public, was collected by the Hubbs-Sea World Research Institute, Sea World's nonprofit research arm.

Drieschman said the idea of a permanent colony began with the National Science Foundation, which has contributed about \$8,900 toward expenses he estimates at \$250,000.

The first crop of 14 Adelie penguin chicks, conceived in the refrigerator, hatched last December and January.

The parents had picked through 500 pounds of rocks flown in from Antarctica to build their stone nests. After the female laid two eggs, the male settled in to incubate them. Penguins, Drieschman said, are frequently monogamous, returning to the same mate year after year.

The Adelies, comical little creatures about 15 inches tall, share the freezer with about 70 Emperor penguins—the 3-foot, 90-pound giants of the penguin world.

The two species mingle amicably in the bare compound. Drieschman said the only real conflicts develop when Emperors, apparently overcome by a mothering instinct, try to adopt Adelie chicks. Then the keepers step in.

"The facility we have now, that's strictly a temporary holding facility," he said. "We have a responsibility . . . to maintain these birds in the most natural environment we can."

For the permanent facility, Drieschman foresees a hilly island covered with flaked ice and surrounded by a circular water pond in which "the birds can build up the speeds that they like. In a square tank like we have now, they have to slow down to turn corners."

Collecting the black-and-white birds, which settle by the hundreds of thousands into penguin towns called rookeries on the Antarctic coast, can be an adventure, he said.

The Adelies are no problem, Drieschman said. With one on the nest and the other standing guard, you just drop a net over them both and you've got a breeding pair.

The big Emperors are more complicated. "You just walk up, wrap your arms around them and try to hold on. That's when things get interesting," Drieschman said.

Scientists Flee Volcano's Crater During Eruption

WASHINGTON, Dec. 27 (AP)

A team of six scientists—four from New Zealand and two from the United States—escaped uninjured from an Antarctic volcano that twice erupted Saturday while they were inside seeking gas samples, it was reported yesterday.

A spokesman for the National Science Foundation said a report of the incident was confirmed by the United States Antarctic research base at McMurdo.

The team studying the mechanics of volcanoes was headed by Dr. Warner Giggensbach of Hamilton, New Zealand, and included two U.S. geologists, Dr. Phil Kyle and William McIntosh, both of Ohio State University.

Jack Renirie, spokesman for the NSF, said press reports of a New Zealand government announcement indicated that the volcano Erebus erupted while the scientists were approaching a lava lake inside a mountain, throwing out thousands of volcanic bombs. A second eruption occurred before the men had climbed out of the crater.

Giggensbach was reported to have been hit on the leg by one fragment.

Other members of the team were Carl Thomson and Collin Monteath of Christ Church, New Zealand, and Harry Keys of Wellington, New Zealand. All were equipped with helmets, gas masks and protective clothing.

All Antarctica research is financed by the United States through the NSF.

Whaling Commission Lauded

WASHINGTON, Dec. 29 (AP) — Richard A. Frank, the United States representative to the International Whaling Commission, has praised the commission's decision to reduce sperm whale quotas in the North Pacific by more than 40 percent. The commission cut the North Pacific quota from 6,444 in 1978 to 3,800 in 1979. The commission also called on the countries of the world to prohibit trade in whale products.

Offers pour in

THE British love of ships apparently knows no barriers. The Ministry of Defence have received hundreds of offers for Capt. Scott's Antarctic ship, the *Discovery*, which they offered to give away to anyone prepared to spend the half million necessary for repairs.

SA-designed ice base

South Africa has designed a new Antarctic base different from the one now buckling under the strain of nine metres of ice and snow.

The whole base is enclosed in corrugated steel plates, thus avoiding direct contact with the ice. It was thought out by the Departments of Public Works and Transport, writes Jacques de Villiers. In the new base, cold air will be circulated between the shell and the buildings to keep the temperature below freezing point.

It will be erected in Western Queen Maud's Land, a short distance from the present base.

American Polar Society

DR. NED OSTENSO
President

DR. RICHARD L. CHAPPELL
CAPT. FINN RONNE
DR. JOHN H. ROSCOE
WALTER SULLIVAN
Vice Presidents

AUGUST HOWARD
Secretary

GERALD PAGANO
Associate Secretary

DR. WILLIAM O. FIELD
Treasurer

Board of Governors

ROBERT B. ATWOOD
PROF. WILLIAM S. BENNINGHOFF
JOSEPH A. BRUNTON, JR.
DR. RICHARD L. CAMERON
DR. JOSEPH M. CHAMBERLAIN
GORDON FOUNTAIN
HERMAN R. FRIIS
EDWARD E. GOODALE
DR. LAURENCE M. GOULD
ARNOLD M. HANSON
DR. WILLIAM R. HUNT
DR. WALDO K. LYON
DR. MARY A. McWHINNIE
CAPT. DAVID C. NUTT
CHARLES E. PASSEL
DR. MARTIN A. POMERANTZ
DR. THEODORE SHABAD
DR. ALAN H. SHAPLEY
MRS. PAUL A. SIPLE
CHARLES H. STOLL
PROF. NORBERT UNTERSTEINER

The Polar Times

Published June and December
by the
AMERICAN POLAR SOCIETY,
August Howard, Secretary,
98-20 62nd Drive (Apt. 7H),
Rego Park, New York 11374
AUGUST HOWARD, Editor

THE POLAR TIMES highly recommends "The Polar Record," published by the Scott Polar Research Institute, Cambridge, England.

The American Polar Society was founded Nov. 29, 1934, to band together all persons interested in polar exploration. Membership dues are \$2.00 a year or \$5.00 for 3 years, which entitles members to receive THE POLAR TIMES twice a year.

Back issues, No. 1 through No. 77, if available are 50 cents each. Issue 78 and onward are \$1.00.

The American Polar Society is classified as a tax exempt organization under Code Section 509 (a) (2).

Books: An Icy Beauty

By HERBERT MITGANG

ANTARCTICA. By Eliot Porter. Foreword by Walter Sullivan. Illustrated. 168 pages. E.P. Dutton. \$35.

CHINA is opening to tourism this year, with the cola salesmen in the vanguard, followed by the acupuncture journalists, and can Carvel be far behind? That leaves the Antarctic as one of the last places without wall posters, politically troubled inhabitants or the promise of pizzerias. For the fortunate visitor, there are only brilliant sights and silences to see and contemplate. An occasional trip is put together for the well-heeled, but it is doubtful if organized tourists can witness all the wonders that appear in Eliot Porter's latest exploration into the natural world — a stunning picture and textbook, "Antarctica."

The light and shadow here look unreal — somewhere between the photographer's and the painter's hand. Nearly all of Dr. Porter's 87 color pictures offer a different, unexpected look: icebergs in a channel that seem like sleeping prehistoric beasts; penguins in top hats and tails that resemble puppets strolling on cue; glaciers

that turn into topographic maps from above; stones polished by windblown sand that the author calls "ventifacts." The still photographs convey a great feeling of stillness.

The author went to Antarctica for the National Science Foundation to document its activities and prepare an exhibition. He sprained his shoulder, was hospitalized at a Russian base and was treated with friendship — no cold war in the cold Antarctic. We learn from an introduction by Walter Sullivan that the United States spends \$50 million a year to operate its Antarctic bases and support scientists seeking to extract the secrets of the snow-white continent.

But Dr. Porter — who has photographed Baja California, the Adirondacks and other natural areas in previous books — anticipates changes as nations strive to fill their energy needs. "The machinery, the supportive establishments, and the roads that will be necessary for exploration for oil cannot but reproduce a devastation at least equal to that for which the consortium of petroleum corporations at Prudhoe Bay on the Arctic coast of Alaska have been responsible," he warns. Until then, "Antarctica" can serve as a far-out trip in book form for the armchair traveler.

The New York Times



ANTARCTICA: selected stations and physical features.

Lubbockite Renowned For Work In Antarctic With Byrd Dies

LUBBOCK, Tex., Oct. 2

INTERNATIONALLY-KNOWN geologist Dr. Franklin Alton Wade, 75, renowned for his geological surveys of Antarctica and a member of two historic Antarctic expeditions with Adm. Byrd, died early Sunday in Methodist Hospital following a brief illness.

Services for the longtime Lubbock resident will be at 3 p.m. today at St. Paul's Episcopal Church with the Rev. J.M. Washington, pastor, officiating.

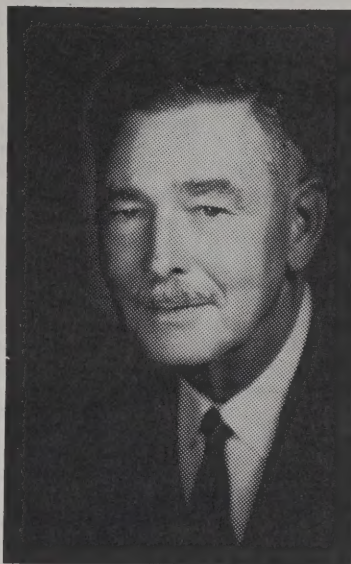
Burial will be in Resthaven Memorial Park under the direction of Henderson Funeral Home.

Wade, of 5203 16th St., was a native of Akron, Ohio. He married Sarah Jane Richards in 1938 and moved to Lubbock in 1954 as head of the Texas Tech University department of geology, a position he held until 1964.

He was respected as one of the world's leading authorities on Antarctica. He was chief scientist of Adm. Byrd's 1939-40 expedition to Antarctica and previously had been a member of Byrd's 1933 expedition to the continent at the South Pole.

He holds two special Congressional medals for his work with Byrd.

He served as a major with the U.S. Army Air Corps during World War II and was base commander of the Greenland Ice Cap Detachment from 1943-44. Wade also was chief of the Operations Analysis Office with the Far East Air Forces in 1950-51 and was conferred with the Mer-



DR. FRANKLIN ALTON WADE
Ex-Tech Geology Department Head

itorious Civilian Service Award in 1952.

Wade is best known here for his outstanding work in strengthening the graduate program in geology at Texas Tech. He was a Horn Professor of Geosciences from 1954-73 and had been a research associate at the Museum of Texas Tech since 1973.

He also was president of the American Polar Society and a member of St. Paul's

Episcopal Church where he was vestryman.

He received his master's degree in chemistry from Kenyon College in 1926 and a doctorate in geology in 1937 from Johns Hopkins University.

He is survived by his wife.

Pallbearers will be Dr. Grover E. Murray, Dr. Richard Mattox, Bob Smith, Robert E. Smith, Carl Cathey and Dr. John Brand.

CONGRESSIONAL RECORD

TRIBUTE TO ANTARCTIC EX-
PLORER DR. FRANKLIN ALTON
WADE

HON. GEORGE H. MAHON

OF TEXAS

IN THE HOUSE OF REPRESENTATIVES

Saturday, October 14, 1978

● Mr. MAHON. Mr. Speaker, many people across our Nation and around the world know of Dr. Franklin Alton Wade. He was one of the world's foremost authorities on Antarctica, having been a member of two of Adm. Richard E. Byrd's expeditions to the continent at the South Pole. For this reason and others, I felt it appropriate to take note of his passing on October 1 in my hometown of Lubbock, Texas.

Dr. Wade's was indeed a long and distinguished career. He received a master's degree in chemistry from Kenyon College in 1926. In 1933, he went to the Antarctic for the first time with Admiral Byrd. In 1937, he earned a doctorate in geology from Johns Hopkins University, then was named chief scientist for Byrd's 1939-40 expedition. He received two special congressional medals in recognition of his contributions in Antarctic exploration.

When this country entered World War II, Wade used his valuable Antarctic experience, serving as a major in the Army Air Corps and as base commander of the Greenland Ice Cap Detachment. In the early 1950's, he continued to serve his country as operations analysis officer with the Far East Air Forces, for which he received the Meritorious Civilian Service Award.

It was in 1958 that Dr. Wade came to Texas and to Lubbock. He joined the faculty of Texas Tech University as head of the department of geology, a position he held until 1964. In the Tech community, he is renowned for his contributions toward strengthening the graduate program in geology.

But Wade's interest in the Antarctic never waned. He journeyed to the South Pole again in 1969. Using data he gathered himself and data gathered by others, he continued his studies into the 1970's. At the time of his death, Dr. Wade was working on the preparation of additional geological maps of the area.

Scientists worldwide will remember Dr. Franklin Alton Wade for his scientific contributions and for the 16,000-

foot Antarctic mountain named for him; but the people of West Texas will remember Al Wade also for his enthusiasm for life, for his Christian dedication, and for his youthful spirit. ●

Aviator Charles Blair Killed

Charlotte Amalie, U.S. Virgin Islands (UPI)—Charles Blair, famed American aviator and husband of actress Maureen O'Hara, died in a plane crash yesterday in which three other persons were killed and seven New York City residents survived, the Coast Guard reported.

A spokesman for Antilles Airboat said the Grumman Goose, a World War II vintage flying boat, apparently had engine trouble and sank after making a crash landing in heavy seas about one mile west of St. Thomas in a flight from St. Croix.

The seven New York residents were rescued from the waves by civilian boats and three Coast Guard

vessels that sped to the scene after the aircraft sank.

Blair, 63, whose actress-wife was in her native Ireland at the time of the crash, was awarded the Harman trophy by President Truman in 1951 for the first solo crossing of the North Pole in a single-engine airplane.

Blair flew a P-51 Mustang from Bardufoss, Norway, to Fairbanks, Alaska, in 10 hours and 27 minutes in the first solo single-engine flight over the pole.

A former Air Force brigadier general and a Pan Am senior pilot, Blair often piloted his own aircraft for Antilles Airboats, a commuter airline. Sept. 3

A Very Personal History

Reflections
On Science

Dr. Ned Ostenso

Director, Office of Sea Grant
National Oceanic and
Atmospheric Administration

DEPARTMENT OF COMMERCE

Mine has been a privileged life. Not by fortune of inheritance nor heritage. Rather, luck and good timing have positioned me to get a very personal view of recent science history.

To begin with, I had the good sense to be born at a time and in a place where the action was. There are more scientists living and working today than had existed *in toto* from the dawn of civilization to 1930—the year of my birth. When I entered college, 80 percent of the world's research and development was being done in the United States. Finally, I stumbled into fields that were truly pioneering and thus destined to throw open shutters to vistas of intellectual splendor rarely equaled. When I studied geophysics, my professors were inventing the field; when I taught oceanography, my students and I were inventing that field as we went along.

Allow me to give some vignettes from my personal experience that illustrate the social and intellectual changes that science has undergone over the past three decades—and then hazard some predictions. Many of you who read this have had similar experience which may or may not lead you to agree with my conclusions. Although I will argue for my position as being privileged, I do not, for a minute, believe it to be unique (except in detail) and my observations may be more provocative than profound.

When I was in college, my research grant constituted the use of my major professor's gasoline credit card, thanks to Dr. George Woollard's own munificence. It wasn't until the day before sailing for a year and a half tour in Antarctica that I learned I was actually going to get paid. Not only had I taken the term "volunteering" literally, but having the opportunity to do research was generally regarded as a privilege and not a source of income. For the most part, the equipment we had was what we made ourselves, from seismometers to magnetometers. I am not saying that those are the good old days, albeit the memories are fond. Today's reasonable compensation to the researcher plus his supporting infrastructure of technicians, laboratories, computers, etc., is the proper and necessary direction of social evolution reflecting society's expectations from the scientific milieu.

Discovery that the Antarctic ice cap was kilometers thick, rather than tens or hundreds of meters as commonly believed, drastically revised concepts of the global water budget with profound environmental implications. I still proudly hold title to the world's thickest ice sounding of 4,270 meters. The discovery was sufficiently startling that when we finally arrived at Byrd Station and radioed our findings back to the Academy of Sciences, the message was believed to have been a garbled transmission.

Years later, I was able to participate in oceanographic research that contributed to true revolution in the earth sciences—seafloor spreading. This new unifying concept of global tectonics ranks with the discovery of the first order. Still later I was involved (although this time not as a practicing scientist) in the excitement of discovering the eddy structure of the oceans. Surface and subsurface currents that were regarded to be the dynamics of the oceans are now known to represent only about 1 percent of the kinetic energy of ocean motion. A few years ago the remaining 99 percent was found to be bound in still poorly understood eddy structure which hold many analogies with atmospheric weather systems. During brief stints in the Executive Office and the Legislative Branch, I was able to champion for earthquake prediction and climatic forecasting, exciting nascent areas of research. So, in a variety of roles, I have had the privilege of being a witness to, and participant in, a truly exciting parade of progress.

NOAA Magazine October 1978

Biologists Say Whales Sing, Trap Fish

Dec. 15

By WARREN E. LEARY

WASHINGTON (AP) — Humpback whales are both song stylists and compulsive composers who constantly change their tunes. And when not serenading, they fish — using air bubble "nets" to collect their catch.

"We are aware of no other animal besides man in which this strange and complicated behavior occurs and we have no idea of the reason behind it," Dr. Roger Payne said Thursday.

Payne and another marine biologist, Dr. Sylvia A. Earle, told a briefing at the National Geographic Society that new studies show the humpbacks are the only whales known to produce underwater "songs" — long, complex sequences of repeated phrases.

"We are beginning to have less and less hope that another species of major whales will be found to have songs, even though others make monotonous sounds," Payne said.

Payne said the songs seem to be more than just a method of communication, even though preliminary data suggest that only males sing and mostly at night during the winter mating season.

The January issue of National Geographic magazine contains companion articles on humpbacks by the two scientists, whose work is par-

tially supported by the society, and a special phonograph recording of whale songs.

Ms. Earle studied the summering of humpbacks in Alaskan waters and confirmed the observations of Charles and Virginia Jurasz that the whales blow circles of bubbles to trap the small sealife that makes up their meals.

"For the most part humpbacks feed by lunging forward and straining the minute zooplankton through sieve-like baleen plates attached to their upper jaws," she said.

But when the food is scattered, she continued, a whale dives beneath its prey and swims in an upward spiral, releasing streams of bubbles through its blowhole.

As the circular wall of bubbles rises, krill and other fish concentrate in the center and the whale surfaces in the middle of the circle to gulp them down.

Ms. Earle said she and her colleagues sampled the contents of bubbling rings to confirm that they teemed with fish. But the experience sometimes was unnerving, knowing that tons of whale was rushing up to the same spot.

"It was occasionally disconcerting to be sitting in our small boat and seeing bubbles come up all around us," she said. "But the whales knew where we were and we were in no trouble. They are very gentle and don't bother people."

Payne said there are about 6,000 humpbacks left in the world

Cuts Whale Quota

TOKYO (AP) — The 1979 quota on the number of sperm whales caught in the North Pacific was cut to 59 percent of 1978 levels at a special session of the International Whaling Commission on Wednesday.

Whaling was also made illegal in a vast area to the south and west of Australia.

The Soviet and Japanese delegations formally agreed not to take whales from the Australian area although theoretically the fleets of the two remaining major whaling nations could have taken over a small Australian quota. Australia has decided to do away with its only land-based whaling operation.

The 17-member commission, however, did not go so far as to adopt a U.S.-backed move to limit the North Pacific sperm whale catch to males only. Conservationists have been asking for protection of female sperm whales in order to allow for a building up of what they say is a depleted sperm whale population.

The special session of the IWC had to be called because no agreement was reached on the zero female quota proposal at the regular conference in London in June.

The special session finally hammered out a last minute compromise at midnight Tokyo time. The total quota was cut to 3,800 head from this year's 6,444 and a formula was

adopted allowing whalers to catch 437 females.

The sperm is a toothed whale highly prized for its oil which is used as a high-grade lubricant. The males grow to over 40 feet but the females generally remain below 36 feet in length. Japan exported about 3,600 tons of sperm whale oil last year. Unlike baleen whales, sperm whales are not used for food.

Conservationists have been asking for international protection of the sperm whale. Lew Regenstein, representative of the Washington based Fund for Animals, said after the meeting, "the 3,800 head quota is not bad considering that the IWC has consistently given whaling nations higher quotas than the previous year's catches."

A Japanese delegate who did not wish to be identified said "we are not satisfied with the quota cuts." The Japanese explained that the 41 percent decline in the quota will be bad news for Japanese fishermen still engaged in whaling.

Members of the Japanese seamen's union demonstrated outside the Japanese foreign ministry building during the two day meeting, shouting slogans accusing the delegates of non-whaling nations of "emotionalism."

Dec. 21

First Woman to 'Winter' at South Pole

She'll Be in Charge of 17 Men's Health

By Cristine Russell

Washington Star Staff Writer

Sept. 23

One more all-male bastion is about to be scaled at one of the most remote spots on earth — the South Pole.

It was less than a decade ago that women even set foot on Antarctica's southernmost spot. Now the first female is about to spend the winter there — along with 17 members of the opposite sex in a remote United States research station.

Twenty-seven-year-old Dr. Michelle Eileen Raney will also be the first woman to head the medical facility at the Amundsen-Scott station since it opened in 1956.

As the only physician, she'll be in charge of her male colleagues' overall health and safety during an eight-month stretch — from mid-February to November — in which severe weather conditions sever all ties, except by radio, with the outside world.

UNTIL NOW THE station has been manned during the winter by a crew of scientists and technicians in charge of keeping the base operating for the National Science Foundation, but Raney isn't afraid to assume the unique role of sole woman and doctor on the team.

"If I didn't think it could be done, I wouldn't be going," she says, with calm self-assurance, of her newly assigned responsibilities. "I don't think it will be easy, but it's a unique opportunity, that's for sure."

Raney received her medical degree from the University of Southern California last year.

On the issue of breaking the sex barrier which has previously existed on the South Pole's year-around crew, Raney is more reluctant to talk and obviously wants to avoid drawing attention to herself as a women's liberation symbol.

She says quite simply that she "never thought much about it. Now everyone's making a big deal. I'm going down there as a doctor and as a person. I don't expect any problems. To think it couldn't be a problem would be terribly naive."

She's watching out for difficulties that might develop if she doesn't draw a very careful line in her dealings with a group of men isolated inside the geodesic dome station for so many months.

"There certainly could be problems, mostly because being the only woman, people might be vying for my attention. Should I become more attached to one person? I can't afford to exclude anyone," Raney said in an interview.

SHE MET MOST of the men she will be living with at an orientation meeting in Arlington this week and describes the group as "young enough to be in tune with giving a woman equal opportunity," adding that those "most worried about it seem to be the people who aren't going down there."

Woman's liberation has been slow to come to Antarctica, but now — with the selection of Raney — most of the "firsts" have been accomplished:

- The first to visit was a Norwegian whaling captain's wife who went to the continent in 1935.

- In 1947-48, explorers Finn Ronne and Harry Darlington spent the winter there with their wives on a private expedition.



DR. MICHELLE EILEEN RANEY
To winter in Antarctica

- In 1962, women scientists first participated in the U.S. Antarctic research program in a cruise ship studying life in the surrounding waters. It was seven years before women scientists set foot on the continent.

- And in November, 1969, a group of six women traveled to the South Pole and jumped off the airplane ramp together to avoid any dispute as to who was the first woman to reach the bottom of the globe.

Since then increasing numbers of women have joined the staff during the shorter "summer" season (the Antarctic summer is the opposite of ours). Nearly 50 will be among more than 1,000 Americans flocking to several research stations over the next few months to conduct scientific studies or serve on the civilian and Navy support staffs.

DURING THE WINTER only about 100 individuals are left behind, with the majority staying at the McMurdo station, located on the edge of the continent some 820 miles from the South Pole.

In 1974, two women scientists, one of them a nun, "wintered-over" at McMurdo for the first time. Last year a married couple did so and a single woman is currently completely a year's stay as a computer technician there.

But the possibility of putting a women in the more confined, less accessible inland stations, such as that at the South Pole, has worried some participants in the Antarctic program.

A reporter visiting Antarctica last

year was warned by several seasoned veterans that putting a women in the midst of what was already a volatile emotional situation — "cabin fever" inevitably sets in — might even result in violence.

Robert L. Murphy, who hired Raney as part of the support team provided by the California-based contracting firm of Holmes and Narver, emphasized, however, that she was the "best qualified" applicant. "We're not doing this to wave the flag for woman's lib. The cards just fell in her favor."

HE ADMITTED that "we tried to throw as many roadblocks as possible into her thinking to make sure she was really serious. We may have been a little tougher than we would have been on a man in a similar situation."

Ron Peck, a married man who will head the South Pole staff, met with Raney before she was hired and they "decided between them they were compatible and that it didn't create any problems," said Murphy.

Dr. Edward Todd, head of the government's Antarctic effort, says he concluded that "if she meets the qualifications there's clearly no legal basis I know of to keep her out. Eventually it had to happen."

The one remaining barrier to women in Antarctica appears to be the Navy, which in the past has allowed women to accept summer but not winter assignments there.

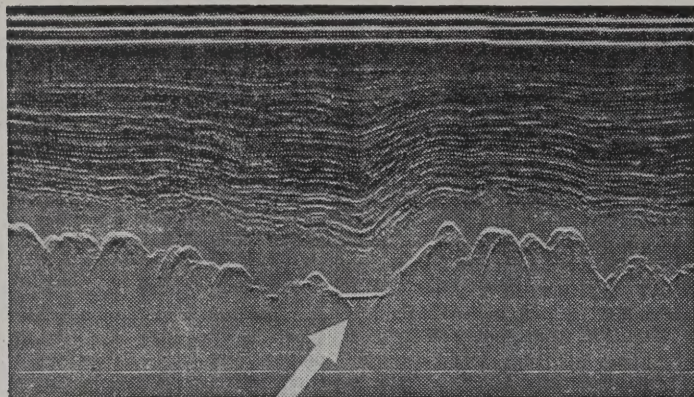
One Navy spokesman indicated that an admiral will soon be traveling south to look into the question further. However, a follow-up response indicated that the policy has been changed to "permit" assignment of "qualified women volunteers to winter" on the continent in 1980 "so long as appropriate funding is made available."

AS FOR RANEY, a native of sunny Los Angeles, the journey south to one of the coldest spots on earth will begin in early November. She's been bracing herself for the snow, taking a special course in dentistry, and getting some advice about how to deal with the variety of medical emergencies that might arise.

Given the "life-and-death" responsibilities she will have, the prospects of male-female difficulties developing seem more remote. Besides, when she's not minding the South Pole infirmary, she will be helping with a scientific experiment on infectious illnesses as well as managing the station store.

Besides her medical duties, Dr. Raney will also be manager of the station store and the post office, and do other jobs such as helping unload aircraft.

Radar Maps a Rugged Land Beneath Antarctica



Radar profile shows mountain range hidden beneath a mile or more of ice, upper lines, in the Antarctic. Arrow indicates a lake beneath the ice.

By WALTER SULLIVAN

The New York Times

CAMBRIDGE, England — For some 20 million years, a region of the world comparable in size to Europe has remained hidden under Antarctic ice. Now systematic surveying with airborne radar is bringing to light its entombed mountains, ice-buried lakes — some more than 100 miles long — and deep troughs testifying to past upheavals in the earth's history.

Radar probing has shown that the Antarctic ice in places is more than 15,000 feet thick, but here and there beneath it are tablelands and great sedimentary basins similar to those of Australia and Africa. The three continents were a single land mass 60 million years ago.

Although the covering ice sheet is relatively smooth, the landscape that has been revealed beneath it is, in some regions, extremely rugged. Along the 135th meridian — close to the western boundary of France's territorial claim, Adelie Land — a north-south escarpment has been discovered that is more than 8,200 feet high in some places and is 160 miles long.

East of it lies a trough with an ice-laden floor several thousand feet below sea level. David J. Drewry of the Scott Polar Research Institute here, in charge of the surveys, likens this great elongated gash in the earth's crust to that of Lake Baikal in Siberia, the world's most voluminous body of fresh water.

Heat From Within Earth Melts Lakes

The lakes under the ice produced an echo easily recognized on the radar. The water in them was melted largely by heat flowing up from the earth's interior.

The surveys, conducted with equipment carried by American aircraft, are a cooperative effort between the institute here, associated with the University of Cambridge, and the American research program financed by the National Science Foundation.

In eastern Antarctica, the vast continental block south of Australia and Africa, more than a million square miles of terrain buried under ice have already been mapped on a series of flight lines 30 to 60 miles apart. These have charted a series of mountains completely buried beneath the ice in the vicinity of the Soviet inland base, Vostok. They are known as the Gamburtsev Mountains.

The great valley east of the escarpment along the 135th Parallel has been tentatively named the Aurora Basin for the ship Aurora of the Australian explorer, Sir Douglas Mawson. A similar feature lying behind the coastal sector of the Transantarctic Mountains has been called the Wilkes Basin, as it forms part of Wilkes Land.

Radar, seismic and magnetic measurements indicate that these basins are filled with sediment, in some places several miles deep, that was laid down by erosion when this region, welded to Australia and Africa, was free of ice and exposed to weathering in a less frigid latitude.

The radar probing also indicates that the great depos-

its of sediment under the floor of the Ross Sea, the southernmost extension of the world oceans, extend at least 60 miles inland under the grounded ice of Marie Byrd Land. Drilling into the sediment under the Ross Sea has suggested the presence there of oil deposits, another relic of the period before this region drifted near the South Pole.

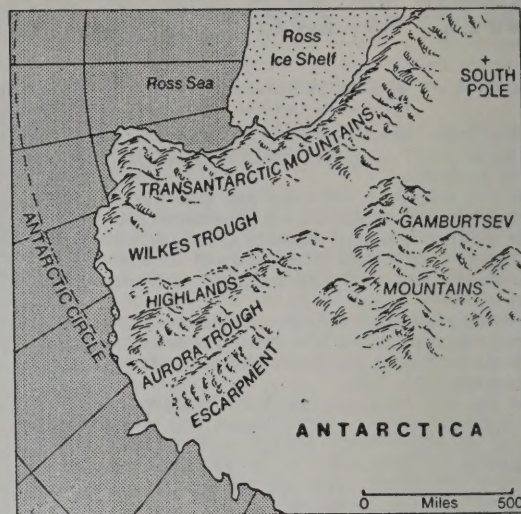
A primary goal of ice-sheet probing in West Antarctica is to aid in assessing the possibility of a "surge," a rapid slippage of a large section of ice into the sea that would raise global sea levels. West Antarctica is the region south of the Americas, and its cover of ice is regarded by some glaciologists as unstable.

A drill hole through the ice in the heart of that region of west Antarctica known as Marie Byrd Land has shown that part of the ice there rests on a lubricating layer of slush. According to Mr. Drewry, however, this is not true where the ice flows over buried peaks and domes, which may prevent the rapid slippage of a surge.

Mapping the magnetic properties of the rock beneath the ice in west Antarctica may help define the line of demarcation between the two plates of the earth's crust. It is suspected that the plates joined and, in doing so, possibly rotated, to form the present continent. Originally, they were puzzle pieces in the supercontinent that broke up to form the land masses of the Southern Hemisphere.

One puzzling result of the radar probing is the evidence of layering within the ice. Some of it may be caused by volcanic ash deposits laid down over the millions of years that have elapsed while the Antarctic ice was accumulating and flowing to the sea.

But drilling into the ice so far has not revealed enough volcanic layers to account for the observations, and it is suspected that they reflect periods when special climatic conditions were depositing other contaminants, such as salt, or producing layers of unusual density. The layers tend to follow contours of the buried mountains, but in the deepest region of ice the layers have been wiped out. Mr. Drewry said that he suspected this was because the ice there had been churned up as it flowed over the rock beneath it.



The New York Times / July 30, 1978

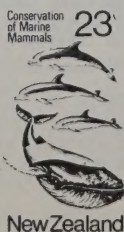
Mapping Beneath A Continent of Ice

Preliterate human beings, and their successors for thousands of years, drew their maps from personal experience, from what could be seen. Today sophisticated instruments enable cartographers to map places they have not seen and will never visit. A case in point is the vast region buried under Antarctic ice and now being mapped by scientists aided by airborne radar.

The area, which is larger than Europe, has been sealed off from ordinary exploration for 20 million years. "Seeing" through ice that is 15,000 feet deep in places, radar has so far enabled cartographers to survey more than a million square miles.

Unlike the fairly smooth ice on top, the hidden terrain is varied and rugged. Along the coast near the Ross Sea and the Ross Ice Shelf lies a range of peaks that have been named the Transantarctic Mountains. Moving westward, explorers have found the Wilkes Trough, a deep, sediment-filled gash in the earth's crust; a highland area; the Aurora Trough, which is being compared to the world's largest body of fresh water, Lake Baikal in Siberia; and then, near Adelie Land, an escarpment that rises 8,200 feet and extends for 160 miles. Farther to the south, near the Soviet Union's inland base Vostok, are the Gamburtsev Mountains.

Mapping is being done from aircraft that follow flight lines set 30 to 60 miles apart. The sponsors of the project are the National Science Foundation in the United States and, in England, the Scott Polar Research Institute, which is associated with the University of Cambridge.



NARL unit pays Soviets a call

By The Associated Press

Three Americans from the Naval Arctic Research Laboratory at Barrow have paid an unscheduled visit to a Russian scientific camp on the Arctic Ocean ice.

The University of Alaska said Thomas A. Gosink of the UA Geophysical Institute and two pilots spotted the Soviet station Sept. 30 while they were on a routine air chemistry sampling flight.

Gosink, John Crouse and John Bitters said they landed at the drifting Soviet camp 170 miles north of Barrow and remained there for more than an hour.

The 40-man Soviet station was established more than five years ago to carry out meteorological and oceanographic observations.

Gosink said the Russians apparently were expecting relief personnel and supplies by air because they were clearing a 5,800-foot runway on the ice.

Before the Americans took off on the return flight to Barrow, they played a short game of ice hockey with the Russians. The score: 1-1.

Eskimo Group To Supply Data

By The Associated Press

The Alaska Eskimo Whaling Commission has contracted to supply data for use in the federal environmental statement for an offshore oil and gas lease sale in the Beaufort Sea.

The Alaska Outer Continental Shelf Office said the contract is the first ever signed to provide research on recorded and unrecorded events in the history of an aboriginal people.

The research will be used in preparing for a joint federal-state offshore oil and gas lease sale now scheduled for December 1979. Arctic Coast natives have opposed oil leasing in the area.

The acting manager of the Alaska OCS office, Robert J. Brock, said the research is to be divided into two phases.

The first phase will involve a summary of recorded information on bowhead whales and other animals of the Beaufort region, as well as data on the physical environment. The work is funded at \$35,390.

The second phase will document unrecorded history. Brock said the funding for the second phase has not yet been set because the money will come out of fiscal 1979 appropriations.

German sets flight mark, nonstop over North Pole

Munich, West Germany (AP)—Dieter Schmitt, a German pilot, completed the first nonstop solo flight across the North Pole in a single-engine plane yesterday and said ice was his most serious problem.



DIETER SCHMITT
...over-the-Pole pilot

The 54-year-old Heidelberg resident landed his Beechcraft Bonanza at Munich's Riem airport at 5:38 P.M. local time, 32 hours and 38 minutes after departing from Anchorage, Alaska, in his plane loaded with extra fuel.

The balding, stocky German smiled and waved to about 50 reporters on the runway as he brought the white aircraft with maroon stripes to a halt on the tarmac. He then crawled out of the cockpit and embraced his wife, Ursula.

"I wouldn't want to have to fly across the Pole under conditions like those again," he said. "The icing was critical for several hours, and I had to drop down to 1,000 feet at times above the polar sea."

Mr. Schmitt, a great admirer of the late Charles A. Lindbergh who in 1927 made the first solo flight across the Atlantic, said he had trouble getting the aircraft aloft because it was 50 per cent overweight from the extra fuel load. He said the weight also was critical because of turbulence in the Arctic region that forced him to fly south to bypass a weather front and then turn north again to cross the Pole.

The flight covered about 5,000 miles, most of it over sea and ice, at an average speed of 150 miles an hour. He crossed Alaska, the polar region, Norway, Denmark and West Germany. The first three hours of the flight were in darkness.

Aug. 20

Satellite Maps Alaska Land

The Anchorage Times

WASHINGTON — The U.S. Geological Survey has prepared a satellite image map of Alaska taken from 570 miles above the earth.

The map is intended primarily for use by geologists and other scientists, but it can also be useful for forestry, environmental studies, land use planning and water management projects.

Among the features clearly visible on the image map are the cities of Anchorage and Fairbanks, the Denali fault system, Malaspina Glacier, Yukon River Delta and North Slope.

The new map does not show the western part of the Aleutian Islands or the southeastern part of the state. The space view of Alaska is a mosaic made from parts of 130 individual images recorded by multispectral line scanners on earth resources survey satellites.

It is the first such mosaic of the state in color.

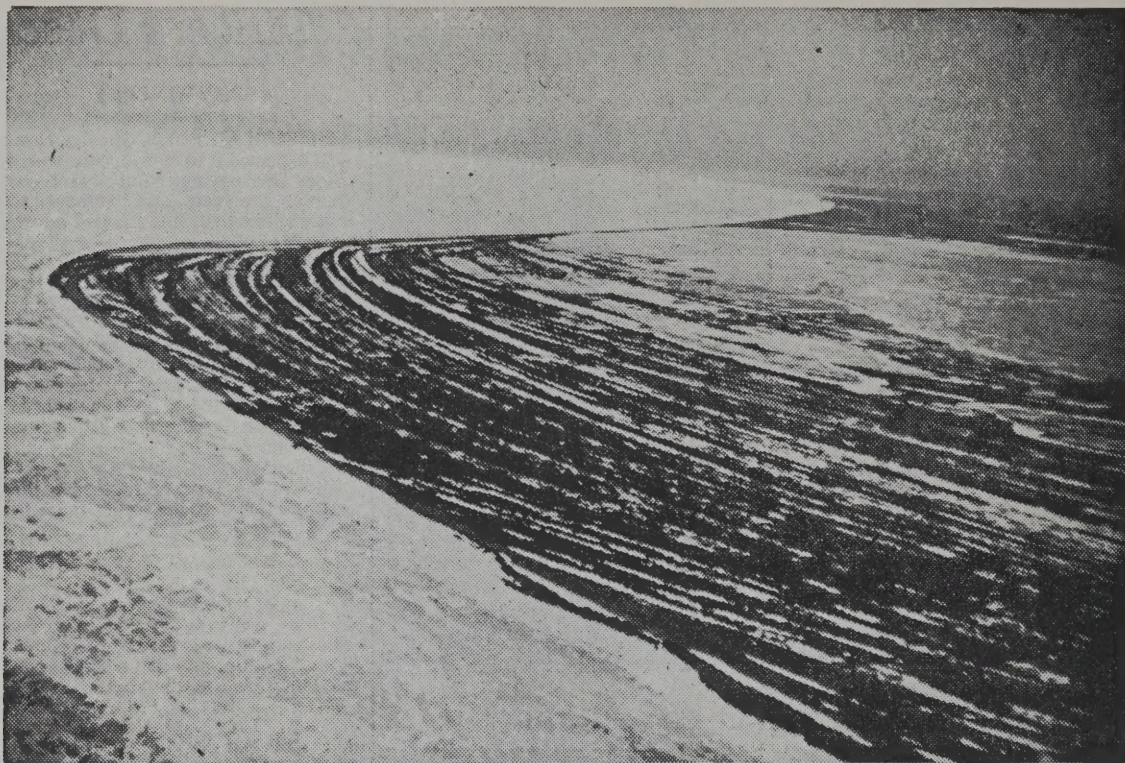
Officers Rescue Sea-Going Moose

NOME (AP) — Two Alaska fish and game officers came to the rescue of a cow moose that had been chased into the Bering Sea on Tuesday.

A couple of dogs chased the full-grown moose a mile offshore from Nome before the agents reached the moose and herded it back to shore. Once back to the water's edge, the moose spent more than an hour making up its mind whether to leave the water. Finally, with about 100 persons watching and about three hours after the spectacle began, the moose returned to the tundra. July 19

Fur Seal Is Born in Mystic

MYSTIC, Conn., July 2 (AP) — Mother and baby are doing fine at the Mystic Marineland Aquarium following what may be the first birth in captivity of a northern fur seal, an aquarium spokesman said today. The pup was born Friday and was nursing from its mother and seemed to be doing well, according to Julie Ladwig. The birth was part of the aquarium's effort to breed sea animals in captivity.



National Park Service

Alaska's Cape Krusenstern. Cyclical weather patterns have created a series of shorelines over the past 5,000 years.

Alaskan Cape Holds a Natural Archive

By GLADWIN HILL

The New York Times

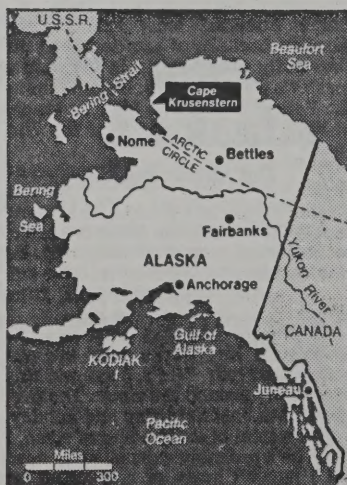
CAPE KRUSENSTERN, Alaska — To the untrained eye, Cape Krusenstern looks from the air simply like another of the many lonely beaches on Alaska's northwestern coast, its pristine solitude altered only by occasional remnants of seasonal Eskimo fishing shelters.

But, with all its stark simplicity, Cape Krusenstern is one of the world's geological wonders, a place where odd weather patterns have constructed a phenomenal natural museum, a sort of open-air archaeological filing cabinet containing the buried remains of successive Eskimo and pre-Eskimo settlements going back 6,000 years.

The 500-square-mile cape is one of about 30 segments of Alaska that, under proposed legislation to classify the state's Federal lands, would be given permanent protected status, in this case as a national monument in the National Parks System.

What look from the air like wave- and wind-carved scallops along Cape Krusenstern's beaches, resembling the contour lines of a map, are a historic series of shore lines, each of them presumably regarded by denizens of the era as the permanent meeting point of the land with that portion of the ocean now known as the Chukchi Sea. But nature had other ideas.

The prevailing winds that sweep the desolate cape come from the northwest.



The New York Times / Nov. 23, 1978

The waves they stir up carry southward masses of gravel deposited at the mouths of the region's many rivers.

But an aberration occurs about every 50 years. The prevailing wind shifts for a season from the northwest to the southwest. In a sometimes deafening display of nature's power — the last time was in 1975 — waves and ice floes combine to act as a giant bulldozer, pushing masses of

gravel from the ocean bottom up against the beach, and building a new shoreline.

No one knows why these wind shifts occur. Robert Belous, the Park Service officer who has had a lot to do with planning the prospective Federal preserves, speculates that the wind shifts may be caused by "periods of heightened solar activity," cyclically affecting weather patterns.

"The beach-building process began about 5,000 years ago," he says, "when the glaciers of the Wisconsin geologic period melted, raising the ocean level and submerging the Bering Sea land bridge between Asia and North America." It was over this land bridge that the forebears of today's Eskimos are believed to have migrated.

Altogether, there are 114 beach "ridges." They extend inland two to four miles, along a span of 50 miles, and were first identified by the late Dr. John Louis Giddings, a Brown University archaeologist.

Dr. Douglas Anderson of Brown University, a former student of Dr. Giddings, has carried on his work and has found artifacts on the inland border of the oldest ridges dating to at least 6000 B.C. The artifacts may be those of the Aphaebaskan people, an ethnic strain in central Canada from which came many North American Indian groups.

Each ridge, when dug into, was found

to contain relics of a distinctive culture — hearths, harpoon points and pottery shards.

The oldest ridges are from No. 114 down to No. 78, and some of them are now below the surface of a fresh water lagoon. They are associated with the "Denbigh flint" people, the earliest-known Eskimos, so named because their principal remains are deftly fashioned flint arrowheads. These early Eskimos first started living there about 2300 B.C.

Ridges No. 77 to No. 36 are identified with three pre-Christian peoples, known as the Old Whaling, Choris and Norton cultures.

Starting approximately with the advent of Christianity were three more cultures: the Ipiutak, which lasted about 600 years; the Western Thule, which flourished for 500 years, beginning about A.D. 900, and the Recent, extending up to the present. The chronology was established by the standard method of measuring the amount of radioactive "decay" in carbon fragments of relics.

'An Unbroken Chronicle'

"The furrowed roads of Cape Krusenstern's ancient beach ridges represent an unbroken chronicle of every major phase of Eskimo pre-history," Mr. Belous said recently in a report published in the National Parks and Conservation magazine. "Walking from back beach ridges where the now distant ocean once lapped, one senses the ghosts of long-vanished hunters on their journey to the present."

Cape Krusenstern is only 40 miles from Kotzebue, a once-remote Eskimo town where airplanes now bring 10,000 visitors every summer.

Whales and seals flourish offshore, foxes and grizzly bears frequent the cape, and it is a nesting ground and way station for many varieties of migrating birds.

One of the stipulations of the national monument program is that the Eskimos will be allowed to continue to hunt on the cape.

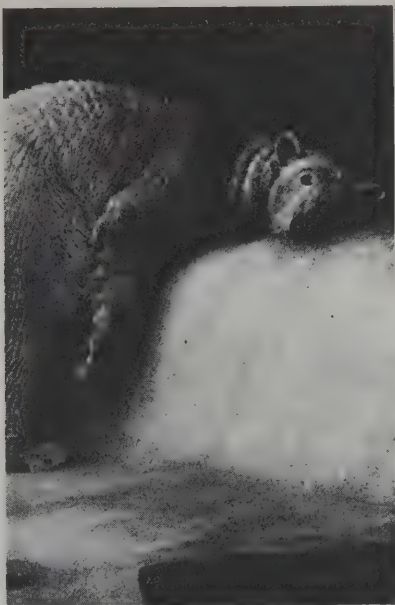
The ocean boundary between the United States and the Soviet Union is only 130 miles west of the cape, and the Siberian mainland only a few miles beyond that. One of the officially expressed hopes of the Park Service is that, by making Cape Krusenstern a Federal preserve, "cooperation will be encouraged with the U.S.S.R. in research and cultural efforts for mutually beneficial programs relating to the Bering land bridge."

Danish Parliament Votes Home Rule for Greenland

COPEHAGEN, Denmark, Nov. 17 (AP) — The Danish Parliament voted today to grant Greenlanders home rule on their 840,000-square-mile island, the world's largest.

Greenlanders are expected to approve the home rule proposition in an election in early January. If they do, the 48,000 islanders, primarily of Eskimo origin, will elect their first parliament in April and will receive home rule rights May 1.

Settled by the Danes as early as the 11th century, Greenland remained a Danish colony until 1953, when a constitutional amendment made it an integral part of the Kingdom of Denmark.



Polar bear at Chicago's Brookfield Zoo

Something to be bullish about.

Furry Funnels

Are polar bears really white?

Polar bears are white because that is nature's way of camouflaging them in the snowy Arctic. Right? Not necessarily, says a scientist at the U.S. Army Research and Development Command in Natick, Mass. After studying the furry beasts, Physical Chemist Malcolm Henry finds that polar-bear hairs are really transparent and only appear to be white. What is more, he says, man can probably benefit by copying this peculiar characteristic.

Henry became bullish on polar bears quite accidentally. After reading in *National Geographic* about the work of the University of Oslo's Nils Øritsland, Henry was surprised to learn that aerial infrared photography, sometimes used to count populations of wild animals, is of no use in tallying baby harp seals or polar bears. Neither of the species register on the film because their external temperatures are virtually the same as that of the cold polar ice around them. More remarkable still, even though both the bears and the pup seals look white to the eye, they show up much darker than the background ice and snow in ultraviolet (UV) photography. Somehow, even though white objects are excellent light reflectors, the animals' bodies absorb virtually all the solar ultraviolet rays that hit them.

Already involved in a project to develop new ways of keeping soldiers warm in the Arctic, Henry decided to find out how the polar bear accomplishes this feat. That was not easy; zookeepers repeatedly rejected requests for a few tufts of polar-bear hair, pointing out that the formidable beasts did not take kindly to plucking or barbering. Finally, a Canadian colleague provided a pelt. The hairs were ex-

amined with a scanning electron microscope, which revealed that they were hollow, like tiny tubes, and contained no pigment whatsoever; they appeared white only because their inner surfaces were rough and, like transparent snowflakes, reflected visible light.

Henry and his colleagues, John A. Sousa and Northeastern University's Richard E. Grojean, concluded that the polar bear's hairs are really miniature light pipes, funneling only ultraviolet light down through its hollow core. If that is indeed how the polar bear traps warming UV, humans may be able to do the same by using a synthetic version of its fur for cold-weather clothing. The Department of Energy, for its part, hopes that similar light pipes may some day be incorporated into solar energy collectors far more efficient than any that exist today. ■

© 1978 Time Inc. All rights reserved.

TIME, DECEMBER 4, 1978

Bottle Goes Back To Chilean Admiral

MELBOURNE (AP)—A bottle containing a message in English, French and Spanish that was thrown into the sea 19 years ago and traveled an estimated 20,000 miles will be returned to the Chilean navy officer who "posted" it on Sept. 9, 1959.

The bottle was found this week on a lonely beach on the south coast of Australia. The officer who threw it overboard while the ship *Carlos Leyma* was on an expedition between Cape Horn and Antarctica has gone a long way too. He is now a vice admiral in the Chilean navy.

Nov. 16

Greenland By Dogsled

TOKYO — Japanese adventurer Naomi Uemura has become the first person to complete a solo voyage by dogsled from the north end to southern tip of Greenland, his expedition office here announced yesterday.

Uemura first journeyed by dogsled north from Ellesmere Island in Canada's remote Northwest Territories and reached the North Pole on May 1. He was then flown to Cape Morris Jesup where he began his solitary trans-Greenland journey May 12.

He arrived at a point 61 degrees 39 minutes north latitude and 44 degrees 10 minutes west longitude, 56 miles north of Narssarsuaq Tuesday after a 1,875-mile trek, the office said. He had supplies and parts for his sled airdropped seven times during the journey, the office said. Aug. 29



United Press International

A view of a settlement in Spitsbergen, characterized by barracks-like buildings surrounded by ice-covered mountains

Soviet and Norway Spar in Arctic Waters

By R. W. APPLE Jr.

The New York Times

LONGYEARBYEN, Spitsbergen — Few inhabited places in the world are more remote and forlorn than this mountainous 24,000-square-mile archipelago in the Arctic Ocean.

Halfway between Norway, to which it belongs, and the North Pole, Spitsbergen presents an uninviting aspect even in midsummer. Longyearbyen, the main settlement, has the dreary look of an army camp, with rows of drab barracks and houses for coal miners. Snowmobiles lie on the gravel outside, awaiting winter's return.

Only a few yellow and white wildflowers relieve the treeless monotony at this latitude — "78 degrees 15 minutes North" — as the sign at "the world's most northerly airport" informs travelers. Longyearbyen is farther north than Alaska's North Slope and Cape Chelyuskin, Siberia's northernmost point.

Because of the permafrost, water mains are laid above ground.

Spitsbergen and the waters around have witnessed economic strife between Norway and the Soviet Union, and they threaten to become the scene of a political-military contest as well.

'Already an Area of Friction'

"This is already an area of friction," said Tim Greve, a Norwegian editor who is the author of "Svalbard," a book about the province by that name, including Spitsbergen. "The question is whether it will become an area of major conflict."

The archipelago's strategic location was underlined once more by a series of



The New York Times / Aug. 6, 1978

incidents in July involving illegal halts by Soviet ships off the north coast of Norway that may have been related to allied listening devices in the 400 miles of the Barents Sea between the Norwegian mainland and Spitsbergen. It is through that gap that ships of the Soviet Union's Northern Fleet enter the Atlantic and return to base.

In a treaty signed in 1920, the great powers awarded sovereignty over the islands to Norway, with all military activity forbidden and all 40 signers granted equal economic rights.

Whaling had long since ceased to be a profitable activity, leaving coal deposits as the main reason for man to live in this inhospitable region. For decades, a Norwegian coal company with headquarters at Longyearbyen and a Soviet coal company with headquarters at Barentsburg, 35 miles away, worked in peace.

All that was changed by a Soviet decision to operate large fleets of missile and hunter-killer submarines in the Barents Sea and by a worsening shortage of two commodities — oil and fish.

Norway has established a special fishing zone off Spitsbergen, but the Russians have refused to recognize it and Soviet trawlers have been unwilling even to report their catches to Longyearbyen. As for oil, several dry holes have been drilled on the islands since 1965, but the real hopes lie on the offshore shelf, where Norwegian seismic tests are reported to have yielded encouraging results. International oil companies are intensely interested in the prospects because the 1920 treaty specifies that anyone discovering oil would pay Norway a tax of no more than 1 percent.

This summer the Danish Government hired a jet plane belonging to a Minneapolis company, Mark Hurd Aerial Survey, Inc., to carry out high-altitude photo-reconnaissance of oil-production possibilities

between Spitsbergen and Greenland. The question is not whether or even how drilling will begin between Spitsbergen and Norway, writes John C. Ausland, a retired American diplomat, in a book to be published in the United States this fall by Westview Press, "but when, where

and by whom."

In an effort to gain control over whatever oil may lie under the Barents Sea, Norway has asserted that Spitsbergen has no continental shelf of its own, being an extension of the Norwegian shelf, and as such is exempt from the treaty.

Because the Soviet Union wants a share of the oil, and also because it wants to keep the sea lanes from Murmansk free of obstruction, it has rejected that argument. The United States, also eager for cheap oil, has reserved its position.

As part of the effort to assert Norwegian sovereignty, Parliament began several years ago to impose stricter rules on activities in Spitsbergen. These, too, have led to conflict with the Soviet authorities in Barentsburg.

Leif Eldring, a former Governor of Spitsbergen who will soon head the Polar Division of the Justice Ministry in Oslo, said the Russians had proved difficult, refusing to observe environmental rules, including hunting restrictions, failing to report helicopter crashes to the civil aviation authorities and refusing to supply a list of Barentsburg residents for tax purposes, paying income taxes in a lump sum instead.

Mr. Greve, the editor, who has his suspicions about Soviet activities in Spitsbergen, noted that six Russians were stationed at the airfield to handle one Aero-flo flight a month. Norway and the Soviet Union each produce 450,000 tons of coal a year, he said, yet 2,000 Russians and only 900 Norwegians live here.

Coal Termed a Soviet Excuse

"I'm sure there is no military activity," Mr. Eldring said. "Everything I have asked to see in four years they showed me, although I wouldn't pretend to know whether they have radio listening posts or things like that. They don't really need the coal. They use it as an excuse to keep a presence here, to keep an eye on other people."

The issues involving Spitsbergen are intertwined, of course, with Norway's membership in the North Atlantic Treaty Organization and with its long-standing dispute with the Soviet Union over the dividing line between the spheres of interest of the two countries in the Barents Sea. One possibility, raised by the Norwegians in talks with the Russians in 1975, is a moratorium on drilling in the area in return for a boundary agreement.

Increasing world demand for oil, as Mr. Ausland says in his book, is likely to make that solution unworkable. The time of reckoning, he maintains, is approaching faster than people think.

Arctic volcanoes

The southernmost known active volcano is Mt. Erebus, on Ross Island off Antarctica. The most northerly is on Jan Mayen Island in the Greenland Sea.

Satellites guide Soviet ship

By Kenneth W. Gatland
The Christian Science Monitor

London

The voyage of the nuclear-powered icebreaker Sibir from the Murmansk to the Bering Strait recently has emphasized the extent to which the Soviet Union is using artificial satellites to aid shipping.

The vessel used no fewer than four types of satellites to ensure a safe and comfortable journey for the crew, whose mission was to find economical new routes for shipping in the northern seas.

Cosmos 1,000 — a navigation satellite — provided the information for the Sibir computer to fix an exact position. Meteor weather satellites gave the crew pictures of cloud cover, snow conditions, and sea ice.

Molniya communications satellites allowed the Sibir to maintain regular contact with its headquarters. Finally, the Soviet television satellite in orbit 22,300 miles above the equator sent the crew entertainment from Moscow.

July 27

ESKIMOS GIVEN LAND IN CANADIAN ACCORD

2,500 in Western Arctic Will Own
37,000 Square Miles and Get
\$45 Million in Cash

By ROBERT TRUMBULL

The New York Times

OTTAWA, July 14 — Some 2,500 Eskimos of Canada's Western Arctic are due to acquire ownership of 37,000 square miles of land under an agreement announced jointly today by the Canadian Government and an Eskimo organization.

The accord, which provides that the Eskimos would obtain mineral and other rights in some areas and receive \$45 million in cash, covers a relatively tiny part of the Northwest Territories, a vast federally administered area populated by about 11,400 Eskimos, 7,180 Indians and 16,225 others. The Eskimos live mostly by hunting, fishing and trapping in the wastelands north of the timberline.

To become effective, the settlement, which grew out of an Eskimo claim presented to the Government in May 1977, must still be approved by a vote in the six small Eskimo communities affected.

It has already been approved by the Cabinet of Prime Minister Pierre Elliott Trudeau, and an "agreement in principle" covering the terms made public today is expected to be signed shortly by the Department of Indian and Northern Affairs and the Eskimo organization, the Committee for Original People's Entitlement.

Other land claims advanced by native peoples of the Canadian north are expected to prove more difficult for the Government to settle because of their greater complexity. They include a demand by Indians of the Northwest Territories for a 450,000-square-mile tract south of the timberline and extensive

claims by the Eskimos of the Eastern Arctic. Major claims are pending also in the Yukon Territory and British Columbia.

Hugh Faulkner, the Minister for Indian and Northern Affairs, said in a news conference after today's announcement that none of the other claimants could expect better terms from the Government than those worked out for the Western Arctic.

The Eskimos of the Western Arctic are to receive title to 700 square miles of land around each of their six settlements — Inuvik, Tuktoyuktuk, Aklavik, Paulatuk, Sachs Harbor and Holman Island — including all rights to oil, natural gas and other underground resources. Also included are 800 square miles of Cape Bathurst under the same terms. In addition, the Eskimos are to be given ownership, but only limited resource rights, for 32,000 square miles.

Areas already under exploration or development for gas, oil or other resources are excluded from the agreement.

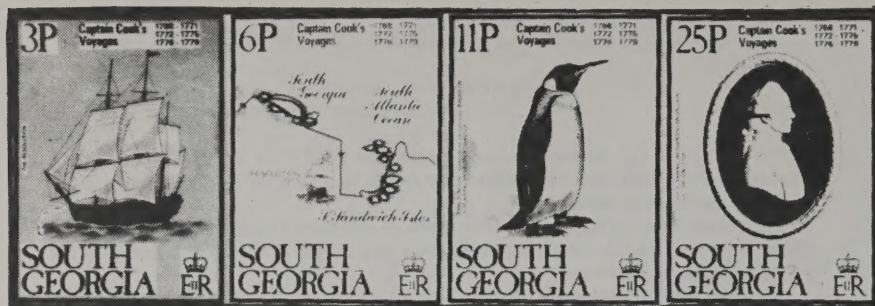
Three Eskimo corporations are to be set up to manage investments, lands and social programs, and an overall land-development study is to be made under a commission with Government participation. The \$45 million in cash is to be paid in annual installments between 1981 and 1994.

Soviet Says It Plans to End Its Whaling in Five Years

LA JOLLA, Calif., Dec. 9 (UPI) — The Soviet Union plans to end its whaling industry within five years, the Soviet delegate to a scientific meeting of the International Whaling Commission has said.

The Soviet Union, which with Japan takes the largest number of whales each year, will first stop whaling in the North Pacific and then in the Antarctic, Vyacheslav Zemsky, chief of the three-member delegation, said yesterday.

He said the size of the whaling fleet had been reduced by nearly half over the last few years and no new catcher boats, the small craft that chase whales, were being built. He said the decision was based on a "truly conservationist approach and, of course, economics plays a role."



South Georgia honors Cook

South Georgia honors Capt. James Cook's voyages with four stamps slated for February release, according to Crown Agents Stamp Bureau, St. Nicholas House, Sutton, Surrey SM1 1EL, England. The set was designed and printed in lithography in panes of 50 by Walsall Security Printers Ltd. The quartet includes 3 pence, *Resolution*; 6p, map showing South Georgia and South Sandwich islands with the route of Cook's vessel; 11p, *King Penguin* based on an original drawing by Forster; and 25p, Flaxman-Wedgwood medallion (embossed).

The following background information on the four depicted Ice Vessels is supplied by Canada Post.

The Niagara Harbour and Dock Company built the *Chief Justice Robinson* in 1842 to continue the Toronto-Niagara River passenger run during winter. In the tense atmosphere of the period, the Americans feared that this vessel's snout-like prow would prove more useful for ramming their vessels than for breaking ice.

The *Chief Justice Robinson* maintained a reliable winter service, although she sometimes landed passengers far out on the ice. The ship, with its ram bow and walking beam engine, established an excellent reputation, and survived a dockyard fire and running aground, only to be laid up during the depression of 1857.

The ice-choked Northumberland Strait always bedeviled Prince Edward Island's winter shipping. Storms occasionally killed travelers who ventured across the strait in iceboats — little more than rowboats equipped with runners.

Canada ordered the *Northern Light*, having agreed to provide year-round steamer service as a condition of Prince Edward Island's entering confederation. E.W. Sewell, Levis, Quebec, built the ship from wood because people believed ice would easily puncture iron-plated hulls.

The rounded hull of the *Northern Light* rode upward if squeezed by floes. In such circumstances, the crew tried to roll the ship free by pushing barrels of water across the deck.

Lacking a sufficiently powerful engine, however, the ship failed as an icebreaker. The ice often trapped and damaged it, although it persevered from 1876 until replaced in 1888.

Needing a vessel to provision its far northern posts, the Royal Canadian Mounted Police ordered the *St. Roch* from the Burrard Dry Dock Company. Constructed of thick Douglas fir timbers and sheathed with durable Australian gumwood, it had toughness, but with only a 150-horsepower diesel engine, it generated

less horsepower than many modern cars.

Furthermore, the ship rolled wickedly and boasted few comforts, yet from 1928 to 1948, it acted as an Arctic supply vessel and a floating police station. To protect Canadian sovereignty and to emulate the achievement of his hero Roald Amundsen, Henry Larsen sailed the ship east through the Northwest Passage in 1940-42 and west in 1944.

Transport aircraft eventually supplanted the *St. Roch* and now, fully restored, it inhabits a Vancouver museum.

As a Cold War participant, Canada required an Arctic patrol vessel to maintain military bases and to defend its sovereignty. The navy ordered the *Labrador*, built by Marine Industries Ltd., Sorel, and commissioned on July 8, 1954.

Rated as a heavy icebreaker, it sported a helicopter, powerful diesel-electric motors and two 40-millimeter guns. The ship headed north with 20 officers, 12 scientists and approximately 200 men, and by July 29, 1954, had sighted ice in the Davis Strait.

During this maiden voyage, the *Labrador* became the first naval vessel to traverse the Northwest Passage. In 1958, short of manpower, the navy transferred the *Labrador* to the Canadian Coast Guard, which it still serves.

Whale saved

Four divers battled for two hours to save the life of a large sperm whale that had been caught in the shark nets on the Natal South coast, reports *The Star*.

The whale had dragged more than 300 m of shark netting, anchors and all, and was exhausted. It made a loud moaning sound underwater during the rescue. Its mate was nearby.

According to the divers, it was fantastic to hear the two whales communicating after they had cut the one free.

Gen. Sergei Danilin, 78; On Soviet Flight to U.S.

MOSCOW, Dec. 28 (UPI) — The Soviet press today reported the death of Lieut. Gen. Sergei Danilin, the navigator of a historic, record-breaking nonstop flight from Moscow to the United States in 1937.

The military daily *Krasnaya Zvezda* said that General Danilin had died recently at the age of 78 after "a grave and protracted illness."

General Danilin was navigator for the pilots Mikhail Gromov and Andrei Yumashev on a pioneering 62-hour nonstop flight on July 12 to 14, 1937, from Moscow over the North Pole to San Jacinto, Calif., a distance of 6,262 miles. The flight was made in an Antonov 25 aircraft.

General Danilin joined the Soviet Army in 1918 as a private and at retirement was a lieutenant general in the engineering branch.

Krasnaya Zvezda said that he had held a number of senior positions in the Defense Ministry, including chief of testing of new aviation technology. "His contributions to building the military power of the Soviet Air Force were great," the daily said.

Kenneth J. Bertrand

WASHINGTON, Dec. 19

Kenneth J. Bertrand, 68, a professor and chairman of Catholic University's geography department from 1947 until his retirement in 1975, died Sunday of cancer in Washington Hospital Center.

Bertrand was chairman of the Special Advisory Committee in Antarctic Names from 1962 to 1973, and president of the Antarctic Society from 1975 to 1976.

A native of Green Bay, Wis., Bertrand attended Syracuse University and the University of Wisconsin, where he received a Ph.D. in geography in 1937. He moved here in 1943 and worked for the Interior Department as a member of the U.S. Board of Geographic Names.

Bertrand was the author of "Americans in the Antarctica — 1775-1948."

He leaves his wife, Leone, at the home on 40th Avenue in University Park, and a brother, Bernard, of Green Bay.

Services will be held at 10 a.m. tomorrow in St. Mark's Catholic Church, 7501 Adelphi Road, Hyattsville.



Gen. Umberto Nobile, Italian Flier And Polar Explorer, Is Dead at 93

ROME, July 30 (Reuters) — Gen. Umberto Nobile, the Italian aviator who was one of the first men to fly over the North Pole, died last night. He was 93 years old.

General Nobile, accompanied by Roald Amundsen, who had been the first man to reach the South Pole, flew his dirigible over the top of the world on May 12, 1926, three days after an American team crossed it by airplane.

A similar airship flight to the North Pole two years later ended in disaster when General Nobile's dirigible crashed in a blizzard.

Dirigible Pioneer and Explorer

A pioneer in the development of dirigibles and a polar explorer, Umberto Nobile spent the last half of his life attempting to revive the reputation he built in the 1920's and tarnished irrevocably during a few dramatic weeks in the Arctic in the summer of 1928.

His second Arctic exploration in 1928 resulted in the crash of his airship and led to the disappearance of Roald Amundsen, the death of eight of the 16 men who were aboard the airship *Italia*, and a controversy over the blame that was never fully resolved.

An Italian commission of inquiry blamed the general for a navigational error that he said did not occur. It also castigated him for leaving five of the *Italia*'s survivors on the ice when the first rescue plane finally reached their party 30 days after the airship's crash on May 25, 1928. The general said he left the others at their urging to direct the rescue of the dispersed group.

His disgrace — brought on, he argued, by Fascist enemies under the dictatorship of Benito Mussolini — also ended Italy's research into lighter-than-air craft.

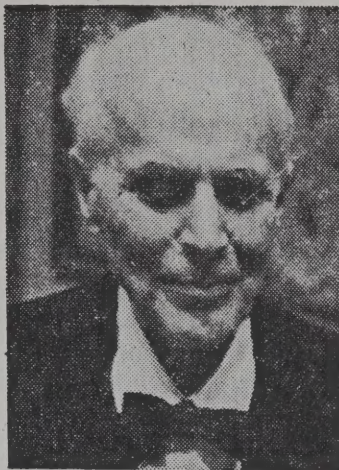
Born Near Naples

Born in the village of Lauro on January 21, 1885, Gen. Nobile learned engineering in nearby Naples, and first worked on airships for military use in World War I.

He designed the 34-ton airship *Roma*, which was sold to the United States Government in 1921. On Feb. 4, 1922, it crashed into a high-voltage line and burned near Langley Field, Va., on its fourth American flight, killing 34 of the 45 persons on board.

Despite such accidents, the idea of polar exploration by dirigible appealed greatly to Roald Amundsen, the man who raced and beat Robert F. Scott to the South Pole by dogsled in the winter of 1911-1912. Amundsen agreed with General Nobile to use an Italian airship, the *Norge*, to fly over the North Pole in 1926.

The *Norge* flew over the pole at 1 A.M. Norwegian time on May 12, 1926, with Amundsen and Lincoln Ellsworth, an American explorer, jointly in command



The New York Times

NOBILE DEAD AT 93: Gen. Umberto Nobile, Italian aviator and explorer.

of the 3,000-mile expedition, of which General Nobile was pilot. They were three days behind the American airmen Richard E. Byrd and Floyd Bennett.

Expedition to Map Arctic

General Nobile mounted an expedition to map the Arctic two years later. The dirigible used for the trip, the *Italia*, was 350 feet long and 65 feet in diameter.

The craft set off from Kings Bay, Spitsbergen, on May 23. It reached the pole May 24 and headed back to Norway, but ran into bad weather and finally, on the morning of May 25, in a still unexplained mishap, it plummeted tail-first onto the ice.

Ten men and General Nobile's dog, Titina, were thrown clear. One man died instantly. The six others were left in the now-lightened cabin and sailed back into the air, never to be seen again. In the floating jumble of ice boulders, it was found that two of the nine survivors, including General Nobile, had broken legs.

The other seven managed to rig a shelter out of a red tent that had been jettisoned in the crash along with some emergency rations and a tiny radio set. After five days together without any response to their radio calls, three decided to walk across the ice for help. Two of them, Italian Navy officers, were picked up safely July 12. They said they had been forced to leave behind Finn Malmgren, the *Italia*'s Swedish meteorologist, who was in a weakened condition. Mr. Malmgren's death eventually brought a storm of protest from the Swedish press.

The six men left in the red tent did not make radio contact with searchers until June 8, when a vast international rescue effort began combing the area north of Charles XII Island. Five men, including Amundsen, whose plane disappeared over the Barents Sea, died in the search for the *Italia*.

On June 24, Lieut. Einar-Paal Lundborg, a Swedish flyer, finally located the tent and landed his plane on skis near it. Agreeing to orders that he be brought out first, General Nobile had himself and his dog carried aboard and flown to the island of Foyn. The pilot flew back immediately to the tent, but crashed on landing. He was not rescued himself until the Russian icebreaker *Krassin* picked up all the remaining survivors July 12.

The recriminations began in short order. In February, 1929, an official commission of inquiry held General Nobile partly to blame and he resigned his commission and retired to private life. The cause of the crash remained undetermined, although the explorer believed it may have been a gas leak in a valve that had frozen open.

In 1932 he went to the Soviet Union to work on the construction of dirigibles. In 1933, it was reported that he had died of peritonitis following an appendectomy in Moscow, and obituaries were printed around the world, only to be corrected by the amused general the next day.

Taught in United States

In 1936 he became head of the aeronautical engineering department of Lewis College of Science and Technology in Lockport, Ill. He returned to Italy in 1943 as an instructor in aeronautics at the University of Naples.

After World War II ended, he won clearance of the charges against him by publishing a book, "I Can Tell The Truth," in which he maintained that his commission of inquiry had been stacked against him by the Fascist regime. In 1945 he was reinstated as a General in the Italian Air Force, and entered politics as a delegate to Italy's 1946 Constituent Assembly.

His interest in politics lasted only a year. Completely retired, he wrote five more books on the *Italia*'s voyage and crash. The last, "The Red Tent," written in 1967, was made into a successful film.

He is survived by his wife, Gertrude, and his daughter, Maria.

Army Dogs Will Wear Nylon Boots for Snow

NATICK, Mass., Dec. 16 (AP) — Working dogs that have to slog through ice and snow on the job may no longer have to worry about getting their feet wet.

Responding to requests from units in Alaska, the Army's research and development laboratory here has developed nylon and deerskin footwear for the dogs. The boots, which replace an unwieldy canvas and leather version, may soon be available to law enforcement agencies to protect police dogs' feet.

The problem with the old boots, said Arthur Reardon, public affairs director for the Army's labs in Natick, is that they had to be laced. Soldiers would suffer frozen fingers after lacing the boots for a dog team in subzero weather.



The four 14-cent stamps, being released as two se-tenant pairs of stamps, feature different methods of travel in the north as depicted by Inuit artists. The stamps were designed by Reinhard Derreth, Vancouver.

The one pair of se-tenant stamps features a color drawing of a woman on foot, by Pitseolak; and a soapstone sculpture of a sailing umiak entitled "Migration," by Joe Talurinili. The other se-tenant pair features a third mode of traditional travel — an ivory sculpture of a dog sled and team — by Abraham Kingmeatook; and a representation of modern influences on travel with a stonecut and stencil print of an airplane, by Pudlo.



The Canadian Ice Vessels issue, due for Nov. 15 release, will complete the popular four-year Ships series. The four se-tenant 14c stamps may be collected complete as blocks of four (as shown) or vertical strips of four because of the plate format.



Antarctic birds, animals

Birds and animals dwelling in the Antarctic are represented on a Fauna series of stamps issued July 30 by the Union of Soviet Socialist Republics. Designed by V. Kolganov, the set includes 1 kopeck, crested penguin hunting in coastal waters; 3kop, white-winged petrel floating over elevated ice rocks; 4kop, emperor penguin, the largest bird of the continent, with its baby and a colony of penguins in the background; 6kop, two white-blood pikes; and 10kop, sea elephant with seashore and icebergs in the background. The stamps were printed in multicolor offset, reports the U.S.S.R. Ministry of Communications.